



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/543,136	07/25/2005	Akio Tanikawa	8008-1074	2635
466 7590 11/30/2007 YOUNG & THOMPSON 745 SOUTH 23RD STREET 2ND FLOOR ARLINGTON, VA 22202			EXAMINER EVERHART, CARIDAD	
			ART UNIT 2891	PAPER NUMBER
			MAIL DATE 11/30/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Supplemental
Office Action Summary

Application No.

10/543,136

Applicant(s)

TANIKAWA, AKIO

Examiner

Caridad M. Everhart

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 27-54 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 27,31-34,41-43,48-50 and 54 is/are rejected.
- 7) ☒ Claim(s) 28-30,32,35-40,44-47,51-53 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.

- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. 11-19-07
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

Supplemental Action

Please see the attached Interview Summary for the reason for this Supplemental Action. No new prior art is cited.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 27,31-34,41-43,48-50 and 54 are rejected under 35 U.S.C. 102(e) as being anticipated by Kozicki et al (US 2004/0124407A1).

Kozicki et al disclose memory devices(paragraph 0003 and methods of forming the same. The device includes an ion conductor and at least two electrodes(paragraph 0010). Electrodes 120 and 130 are at either end of the ion conductor 140 (paragraph 0027 and Fig. 2). When a bias greater than a threshold voltage is applied across the electrodes, the electrical properties of the structure change(paragraph 0028). The electrodes are formed of polysilicon or a metal, and one of the electrodes may be formed of a material that dissolves in the conductor(paragraph 0034 and 0035). The material of the ion conductor material may include germanium-selenide with silver(paragraph 0056). Phase separated regions form in the phase change material (paragraphs 0058 and 0060) of the programmable structure. The supersaturated state is present before

writing, as disclosed in paragraph 0083 . With respect to a temperature increase, it would be expected that with an applied voltage there would be temperature increase, as some of the energy would be dissipated as heat. Because the solid solution is supersaturated, it would be expected that some of the conductor is present as a precipitate at certain temperatures, and that at higher temperatures additional conductor would go into solution. The material of the core is amorphous(paragraph 0068). The application of a bias across the electrodes results in a thermal and electrical change which results in a change in the solubility of the solute and therefore of the proportion of the phases in the memory material(paragraph 0010 and 0030 and 0079). Kozicki et al further disclose materials which are suitable for the solid solution(paragraph 0067). A saturated solution may be formed which has different properties depending upon the bias before and during the write state(paragraph 0078). Arrays of the devices which are combined with word lines to form the memory arrays are also disclosed by Kozicki et al (paragraph 0089). The structure disclosed by Kozicki et al includes a conductor, an electrolyte or active layer, and an electrode. The active material changes properties with the saturation or supersaturation with a metal such as silver(paragraph 0078). The electrolyte remains supersaturated after the write operation(paragraph 0083). The supersaturated state is a metastable state, as it is a non-equilibrium state.

Allowable Subject Matter

Claims 28-30,35-40,44-47,51-53 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 28-30,35-40,44-47,51-53 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record does not teach or suggest the crystallinity nor the recited transformations recited in the allowable claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

C. Everhart
11-27-2007

C. Everhart
CARIDAD EVERHART
PRIMARY EXAMINER